WHAT IS CLAIMED IS:

1. An apparatus for holding cells comprising:

a mechanism for incubating cells having a dynamically controlled environment in which the cells are grown, which is maintained in a desired condition and in which cells can be examined while the environment is dynamically controlled and maintained in the desired condition; and

a mechanism for determining the state of the cells, said determining mechanism in communication with the incubating mechanism.

2. An apparatus as described in Claim 1 wherein the incubating mechanism includes a housing having a biochamber in the housing.

3. An apparatus as described in Claim 2 wherein the incubating mechanism includes a first well and at least a second well in which cells are grown, said first and second well disposed in the biochamber of the housing.

4. An apparatus as described in Claim 3 wherein the housing has a first port mechanism through which the first and second wells in the biochamber can be viewed, and the determining mechanism includes an imaging mechanism disposed adjacent the first port mechanism which images the cells in the first and second wells.

5. An apparatus as described in Claim 4 wherein the housing has a second port mechanism in fluid communication with the biochamber, and the incubating mechanism includes a mechanism for

controlling the environment in the biochamber, said environment controlling mechanism connected with the second port mechanism.

6. An apparatus as described in Claim 5 wherein the environment controlling mechanism includes a heating mechanism in thermal communication with the biochamber to maintain the cells in the first and second wells at a desired temperature.

7. An apparatus as described in Claim 6 wherein the imaging mechanism comprises a computer for identifying whether a cell in the first well or the second well has multiplied, said computer connected to the imaging mechanism to receive images of the first and second wells from the imaging mechanism.

8. An apparatus as described in Claim 7 wherein the imaging mechanism comprises a microscope mechanism which views the first and the second wells, said microscope mechanism disposed adjacent the first port mechanism, said microscope mechanism in communication with the computer.

9. An apparatus as described in Claim 8 wherein the imaging mechanism comprises a camera mechanism for imaging the cells in the first and second wells, said camera mechanism connected to the microscope mechanism such that the camera mechanism takes images of the cells in the first and second wells through the microscope mechanism, said camera mechanism connected to the computer.

10. An apparatus as described in Claim 9 wherein the determining mechanism includes a moving mechanism for moving the first and second wells relative to the microscope mechanism so the microscope mechanism can view the cells in the first and second wells.

11. An apparatus as described in Claim 10 wherein the first port mechanism includes a first window disposed in the top of the housing and a second window disposed in the bottom of the housing and in optical alignment with the first window to form an optical path for light to pass between the first window and the second window.

12. An apparatus as described in Claim 11 wherein the incubating mechanism comprises a transparent plate in which the first and second wells are disposed.

13. An apparatus as described in Claim 12 wherein the environment controlling mechanism comprises a mechanism for controlling media pH in the first and second wells in communication with the biochamber, and a mechanism for controlling pressure in the biochamber in communication with the biochamber.

14. An apparatus as described in Claim 13 wherein the incubating mechanism includes a robotic mechanism for automatically dispensing and aspirating media to and from the first or second wells, said robotic mechanism disposed adjacent the biochamber in movable contact with the first and second wells.

15. An apparatus as described in Claim 14 wherein the robotic mechanism includes a reservoir mechanism for fresh and waste media regarding the first and second wells.

16. An apparatus as described in Claim 15 wherein the determining mechanism includes a diagnostic mechanism in communication with the robotic mechanism for ascertaining an occurrence of a predetermined biological event in the first or second wells.

17. An apparatus as described in Claim 16 wherein the determining mechanism includes a joystick connected to the microscope mechanism to control the position of the microscope mechanism relative to the first and second wells.

18. An apparatus as described in Claim 17 wherein the moving mechanism includes a translation system which moves the plate to align the first or second well with the microscope mechanism.

19. An apparatus as described in Claim 18 wherein the robotic mechanism includes a z-robot pipette through which media is aspirated from or dispensed into the first or second wells.

20. An apparatus as described in Claim 19 wherein the imaging mechanism includes fluorescent material which is introduced to the first or second wells by the z-robot pipette to enhance the imaging of cells in the first or second wells.

21. An apparatus as described in Claim 20 wherein the robotic mechanism comprises a syringe pump mechanism connected to the z-robot pipette and the reservoir mechanism for delivering liquid to the z-robot pipette from the reservoir mechanism.

22. An apparatus as described in Claim 21 wherein the syringe pump mechanism comprises a stepper motor mechanism which provides force to deliver the liquid.

23. An apparatus as described in Claim 22 wherein the reservoir mechanism includes a first reservoir with the growth medium and at least a second reservoir with the quiescence medium.

24. An apparatus as described in Claim 23 wherein the reservoir mechanism includes a distribution valve mechanism connected to the syringe pump mechanism, the z-robot pipette and the first and second reservoirs for directing which liquid from which reservoir is delivered to the z-robot pipette.

25. An apparatus as described in Claim 24 wherein the z-robot pipette has a sensor mechanism which senses the presence of fluid about the tip of the pipette and produces a pipette signal corresponding to the presence of fluids about the tip.

26. An apparatus as described in Claim 25 including a computer which receives the pipette signal, said computer connected to the stepper motor to control the operation of the stepper motor.

27. An apparatus is described in Claim 26 wherein the housing has a bulkhead with a hole through which the z-robot pipette extends into the biochamber.

28. An apparatus as described in Claim 27 wherein the distribution valve mechanism is connected to the diagnostic mechanism to receive medium from the first or second wells.

29. An apparatus as described in Claim 28 wherein the distribution valve mechanism is connected to the computer which controls the distribution valve mechanism.

30. An apparatus as described in Claim 29 wherein the diagnostic mechanism includes an assay for analyzing the media.

31. An apparatus as described in Claim 30 wherein the assay includes a column.

32. An apparatus as described in Claim 31 wherein the assay includes a chromatograph.

33. An apparatus for managing cells comprising:

a housing having a biochamber and at least a first well in the biochamber in which the cells are disposed; and

a robotic mechanism for automatically dispensing and aspirating media to and from the first well, said robotic mechanism in contact with the biochamber.

34. A method for holding cells in a chamber comprising the steps of:

scanning a first cell; and

determining when the first cell has divided.

35. A method as described in Claim 34 including before the scanning step, there is the step of placing growth medium with the first cell.

36. A method as described in Claim 35 including before the scanning step, there is the step of identifying the location of the first cell.

37. A method as described in Claim 36 including after the determining step, there is the step of replacing growth medium with quiescence medium.

38. A method as described in Claim 37 including before the scanning step, there is the step of placing growth medium with a second cell, and identifying the location of the second cell.

39. A method as described in Claim 38 including after the scanning step there is the step of scanning the second cell.

40. A method as described in Claim 39 wherein the replacing step includes the steps of moving a z-robot pipette into a position to aspirate growth medium from about the first cell; aspirating the growth medium from the about the first cell, and adding quiescence medium about the first cell.

~~41. A method for using stem cells comprising the steps~~ of:

obtaining stem cells;

placing the stem cells in an automated system for growing stem cells;

growing additional stem cells in the automated system from the stem cells placed in the automated system; and

gathering the stem cells in the automated system.

42. A method as described in Claim 41 including after the gathering step, there is the step of transplanting stem cells into a patient.

43. A method as described in Claim 42 wherein the obtaining step includes the step of removing the stem cells from the patient.

44. A method as described in Claim 43, wherein the growing step includes the step of maximizing growing pluripotent stem cells while minimizing growing differentiated mature blood cells.

45. A method of producing stem cells comprising the steps of:

placing growth medium with a first stem sell in situ;

determining when the first stem cell divides into a second and a third stem cell in situ; and

exchanging the growth medium about the second and third stem cells in situ with quiescent medium in situ which inhibits differentiation of the second and third stem cells into committed progenitors.

46. A method for holding cells comprising the steps of:

incubating the cells in a dynamically controlled environment which is maintained in a desired condition and in which the cells can be examined while the environment is dynamically controlled and maintained in the desired condition; and

determining the state of the cells.

Add B2

Add D8